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Financial Integration, Globalization, Growth and Systemic Real Risk*

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Abstract

Using data for a large number of advanced and emerging market economies during 1985-2009, this paper documents the dynamics of financial integration and assesses whether advances in financial integration and globalization yield the beneficial real effects resulting from a more efficient resource allocation predicted by theory. We find that: (a) financial integration has progressed significantly worldwide, within regions, and particularly in emerging markets; (b) advances in financial integration and globalization predict higher growth, lower growth volatility, as well as lower probabilities of systemic real risk realizations; (c) financial integration fosters domestic financial development and the liquidity of equity markets; and (d) the quality of institutions and corporate governance are important determinants of the levels of financial integration and globalization. Thus, financial integration and globalization appear to yield direct as well as indirect benefits in the form of improved countries' growth prospects and lower systemic real risk.

JEL Classification Numbers: F36, G15

Keywords: financial integration, growth, financial openness, financial development, equity market liquidity

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I. INTRODUCTION

This paper presents an empirical assessment of whether advances in financial integration and globalization are likely to produce the beneficial *real* effects resulting from a more efficient resource allocation predicted by theory. The vast empirical literature surveyed by Kose, Prasad, Rogoff and Wei (2009) seems to offer contrasting results regarding the benefits and potential costs of "financial globalization". Yet, the term "financial globalization" is often used as a synonym of financial openness, and financial openness is equated to financial integration. But financial integration—defined by standard finance theory as equality of discount factors used to price traded assets—is different from financial openness, and this distinction, as we will show, has implications for measurement.

Our main contribution to the literature is threefold. First, we document advances in financial integration worldwide as convergence of equity premiums. Second, we introduce novel measures of financial integration and globalization, and test their predictive power on measures of growth opportunities that factor in uncertainty about growth prospects, as well as on both growth and growth volatility. Second, we assess the predictive power of financial integration and globalization on measures of systemic real risk that proxy the probability of a severe decline in real activity.

We begin our analysis by documenting the dynamics of financial integration. Following Adjaouté and Danthine (2004), we measure advances in financial integration by declines in the dispersion of equity premiums across countries. Such declines capture increased closeness of countries' discount factors (or pricing kernels) in equity markets, and reduced differentials in the cost of equity capital. By positing a simple statistical model for equity premiums, we use monthly data for a set of 52 advanced and emerging markets economies in the period 1985M1-2009M4 (which includes data of the 2007-2008 financial crisis) to test cross-country convergence of the mean and volatility of equity premiums globally and by region, with a methodology akin to that used in the growth literature. We find strong evidence of advances in financial integration in the form of a declining trend in the cross-country dispersion of equity premiums worldwide, with such advances being primarily—but not exclusively—driven by advances of financial integration in emerging markets countries.

We then turn to the real effects of financial integration and globalization. To this end, we use a novel measure of the level of financial integration consistent with standard finance theory, and a measure of growth opportunities standardized by a proxy measure of uncertainty of growth prospects. We term this latter measure "risk-adjusted" growth opportunities.

The level of financial integration is given by a *distance* measure of a country's equity premium from the group average at each date. The smaller this distance, the smaller is the difference of a country's discount factor from that of a group average. Thus, this measure captures financial integration of a country *relative* to a reference group. The advantages of our measure are three: it is theory-based, it is simple, and it does not require deriving absolute full-integration or perfect-segmentation benchmarks.[1]

Our measure of risk-adjusted growth opportunities is a Sharpe ratio-type measure of market price-to-earnings (PE) ratios relative to the world PE ratio. This complements the measure of growth opportunities introduced by Bekaert, Harvey, Lundblad, and Siegel (2007) (BHLS henceforth) which do not account for PE ratio volatility. Using yearly data for the sample already mentioned, we find that risk-adjusted growth opportunities strongly and robustly predict growth for both advanced economies and emerging markets.

We then proceed to test whether financial integration predicts risk-adjusted growth opportunities, as well as the converse, both at the global and regional levels, using monthly frequency data. We find that advances in financial integration robustly and significantly predict better countries' risk-adjusted growth opportunities, while risk-adjusted growth opportunities do not necessarily predict advances in financial integration. These results suggest that the benefits of a more efficient allocation of capital prompted by financial integration are significant in generating improvements in growth prospects' expectations.

Yet, the foregoing results concern *expectations* regarding growth prospects, not actual growth. Therefore, we examine the predictive impact of financial integration and globalization on both actual growth and a proxy measure of growth volatility using yearly

[1] Earlier application of simplified versions of our measure on specific country groupings are in De Nicolo' and Tiemann (2008) and De Nicolo' and Ivashenko (2008). Our measure can be viewed as complementary to the more complex market segmentation metric recently introduced by Bekaert, Harvey, Lundblad, and Siegel (2009).

data. To our knowledge, no study has examined the *distinct* impact of financial integration and globalization measures on both growth and growth volatility.

Financial globalization is measured by the growth rate of financial openness, defined as the ratio of the sum of external assets and liabilities constructed by Lane and Milesi-Ferretti (2007), standardized by GDP. We test whether advances in *both* financial integration and globalization predict growth and growth volatility. The main finding is that advances in globalization predict higher growth, while advances in integration predict lower growth volatility, and these results are strongest for emerging markets. Thus, advances in integration and globalization appear to foster growth prospects.

The test just described does not fully capture the possible impact of financial integration and globalization on the probability of severe declines in real activity, since growth volatility can reflect both upper and lower tail movements in growth. An assessment of such possible impact is important, since the 2007-2008 financial crisis and the attendant historically sharp drop in real activity has raised the question of whether financial integration and unfettered globalization can be sources of systemic risk (see, e.g. Stiglitz, 2010). To address this question, we test whether there is a significant predictive relationship between financial integration, globalization, and indicators of systemic *real* risk constructed on the basis of estimated left-tail realizations of real growth. We find that higher levels of financial integration and globalization robustly and significantly predict *lower* levels of systemic real risk, and this predictive power is stronger for emerging markets. This evidence is at odds with the view that financial integration and globalization in and of themselves are sources of macroeconomic instability.

Next, we explore three indirect channels through which financial integration may foster growth prospects. We first gauge the extent to which financial integration has a positive impact on globalization, financial development, and market liquidity. We find that financial integration predicts globalization, but the reverse does not hold necessarily. This suggests that the beneficial effects of globalization described in the literature (e.g. Quinn and Toyoda, 2008; Bonfiglioli, 2008; and Bekaert, Harvey, and Lundblad, 2009) may be driven in part by advances in financial integration. Moreover, financial integration predicts both advances in domestic financial development and improvements in equity markets liquidity, but again, the converse does not hold. Thus, financial integration may lead *indirectly* to

improvements in countries' growth prospects through its positive impact on domestic financial development and equity market liquidity.

Finally, we document the relationship between financial integration, globalization and proxy measures of the quality of the institutional environment and corporate governance. Perhaps unsurprisingly, we find that a better quality of institutions and corporate governance are associated with higher levels of financial integration and globalization. However, we also show that their quantitative impact is sizeable, and identify some dimensions of institutional and corporate governance quality that have the strongest quantitative impact on financial integration and globalization.

All in all, our results indicate that financial integration and globalization appear to yield direct as well as indirect *benefits* in the form of enhanced countries' growth prospects, and that there is no evidence of *costs* in terms of macroeconomic instability.

The remainder of the paper consists of five sections. Section II assesses convergence in equity premiums and defines our measure of financial integration. Section III introduces a measure of risk-adjusted growth opportunities, documents its predictive power for growth, and tests the predictive power of financial integration for risk-adjusted growth opportunities. Section IV presents the predictive relationships of financial integration and globalization, for growth and growth volatility, while section V carries out a similar analysis for systemic real risk. Section VI examines the predictive power of measures of financial integration for globalization, domestic financial development and equity market liquidity. Section VII presents evidence of the relationship between financial integration, globalization, and indicators of quality of institutions and corporate governance. Section VIII concludes.

II. FINANCIAL INTEGRATION DYNAMICS

In a perfectly financially integrated region, the cost of equity capital for comparable investment opportunities within the region should be equalized, as firms and investors would face the same pricing of risk. Therefore, in an imperfectly integrated region experiencing advances in financial integration, convergence in the cost of equity capital across countries should be observed.

As in BHLS, we focus on equity markets, since these markets are either ones in which claims on a "representative" variety of countries' investment opportunities are traded,

or represent firms of the most important sectors in an economy. In either case, we may expect a high correlation between growth opportunities underlying the activities of publicly quoted firms and those of the economy as a whole. Using equity market data also allows us to construct measures that are highly correlated with firms' cost of capital.

A. Financial Integration as Convergence in Equity Premiums

As shown in Stulz (1999) and Adjaouté and Danthine (2004), convergence in equity premiums is associated with a convergence in the cost of capital. If markets become more integrated, equity risk should be priced in the same way across countries. And with integration advancing, this price of risk should converge, even if temporary deviations from convergence could occur, because of, say, differences in countries' savings rates or investment opportunities. Moreover, with increased integration, equity premiums should be increasingly affected by common factors, and increased correlations of equity premiums should be observed.

Therefore, advances in financial integration can be gauged by testing whether there is a significant decline in the cross-country dispersion of both the mean and the idiosyncratic volatility of a proxy measure of equity premiums.[2] We assess this convergence of equity premiums with a metric germane to that used to gauge growth convergence in the growth literature (see Barro and Sala-i-Martin, 2003).

Equity premia are ex-ante measures notoriously difficult to estimate using historical data. However, a standard approach is to use ex-post equity excess returns under the assumption that the time average of ex-post and ex-ante excess returns is equal. Thus, we use ex-post equity excess returns as proxy measures of equity premia. To implement this metric, we formulate the following statistical model for the dynamics of the cross-country dispersion of equity premiums

Let $X_{it} = R_{it} - r_{it}$ denote the equity premium in country i at date t, where R_{it} is the market return and r_{it} is the risk-free rate. We assume that X_{it} follows a factor GARCH(1,1) model:

[2] As shown by Solnik and Roulet (2000), the evolution of the cross-country dispersion of equity premium is inversely related to the pairwise correlations in the context of a factor model. .

$$X_{it} = \alpha_{it} + \beta_i F_t + \gamma X_{it-1} + h_{it}\varepsilon_{it} \quad (1)$$

$$h_{it}^2 = a_{it} + b\varepsilon_{it-1}^2 + ch_{it-1}^2 . \quad (2)$$

The term F_t in Equation (1) is a risk factor common to all countries, and the innovations ε_{it} are assumed to be i.i.d. and normally distributed with zero mean and unit variance. Equation (2) describes the evolution of country-specific volatility. The conditional mean of X_{it} is given by $m_{t-1}(X_{it}) \equiv \alpha_{it} + \beta_i F_t + \gamma X_{it-1}$, while the conditional variance is given by $\text{var}_{t-1}(X_{it}) \equiv \beta_i^2 \sigma_F^2(t) + h_{it}^2$. To obtain a model for the cross-country variance of the equity premium and its country-specific volatility, we assume that the coefficients $\{\alpha_{it}, \beta_i, a_i\}$ are distributed cross-sectionally with means $\{\alpha_t, \beta, a\}$ and variances $\{\sigma_{\alpha t}^2, \sigma_\beta^2, \sigma_a^2\}$, and that covariances among all these random variables, as well as that of X_{it-1} and F_t, and each of these is approximately nil. Under these assumptions, the *cross-sectional variances* of $m_{t-1}(X_{it})$ and h_{it}^2 are given by

$$\sigma_X^2(t) \equiv E(m_{t-1}(X_{it}) - Em_{t-1}(X_{it}))^2 = \sigma_{\alpha t}^2 + \sigma_\beta^2 F_t^2 + \gamma^2 \sigma_X^2(t-1) \quad (3)$$

$$\sigma_{h^2}^2(t) \equiv E(h_{it}^2 - Eh_{it}^2)^2 = \sigma_{at}^2 + b^2 \sigma_{\varepsilon^2}^2(t-1) + c^2 \sigma_{h^2}^2(t-1) . \quad (4)$$

We take the first principal component of countries' equity premiums as a proxy measure of their *common risk factor*. Taking into account common shocks is important, as a decline in $\sigma_X^2(t)$ exclusively driven by a decline in the magnitude of common shocks F_t^2 would *not* necessarily indicate increased integration, since disconnected economies hit by the same shock could exhibit the same decline. Increased convergence in the mean of equity premiums occurs if $\sigma_{\alpha t}^2$ exhibits a declining path. Similarly, increased convergence in the country-specific volatility of equity premiums occurs if σ_{at}^2 exhibits a declining path.

We estimate the following GARCH (1,1) counterpart of Equations (3)-(4) :

$$\bar{\sigma}_X^2(t) = A_0 + A_1 t + A_2 F_t^2 + A_3 \bar{\sigma}_X^2(t-1) + H_t \eta_t \qquad (5)$$

$$H_t^2 = B_0 + B_1 t + B_2 \eta_{t-1}^2 + B_3 H_{t-1}^2 \qquad (6)$$

Convergence in the cross-country dispersion of the *mean* of equity premiums occurs if A_1 is negative. Similarly, convergence in the cross-country dispersion of the country-specific *volatility* of equity premiums occurs if B_1 is negative.

Equity premiums are ex-ante measures notoriously difficult to estimate with historical data. However, a standard approach is to use ex-post equity excess returns under the assumption that the time average of ex-post and ex-ante excess returns is equal. Thus, we use ex-post equity excess returns as proxy measures of equity premiums.

We use monthly equity market data from DataStream and Standard & Poor's for the period February 1985-April 2009 for 52 countries, including developed countries and emerging market countries in Europe, Asia and America.[3] The risk-free rate is the yield on government securities at maturities ranging from one month to three months, depending on data availability.

By estimating Equations (5)-(6) including all countries, we test world convergence in equity premiums. Estimates of Equation (5)-(6) are also presented for two different types of country subsamples. The first type of subsample *excludes* from the entire sample countries that belong to a particular region. In this case, a comparison of the estimated coefficient obtained when all countries are included, with that obtained by excluding a subsample, gauges the relative contribution of that subsample to worldwide convergence of equity premiums. This amounts to comparing estimates of the trend coefficients (A_1 and B_1)—when

[3] Each regional sample includes developed and emerging countries. *Developed America* includes the United States and Canada. *Emerging America* (*Latin America)* includes the following six countries: Mexico, Argentina, Brazil, Chile, Colombia and Peru. *Developed Asia* includes Hong Kong, Korea, Singapore, Japan, Australia and New Zealand. *Emerging Asia* includes the following eight countries: China, India, Indonesia, Malaysia, Pakistan, Philippines, Taiwan Republic of China, and Thailand. *Developed Europe* includes the following sixteen countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. *Emerging Europe* includes the following thirteen countries: Czech Republic, Hungary, Poland, Rumania, Russia, Bulgaria, Croatia, Estonia, Latvia, Lithuania, Slovakia, Slovenia, and Ukraine.

$\bar{\sigma}_X^2(t)$ and H_t^2 are computed by including all countries in the sample—with estimates of the trend coefficient when $\bar{\sigma}_X^2(t)$ and H_t^2 are computed *excluding* all countries in a given subsample. The second type of subsample *includes only* countries in a particular region. Thus, estimates of the trend coefficients provide a gauge of convergence of equity premiums *within* a region-- that is, a measure of *regional* financial integration.

Table 1 reports the results of the estimation of Equations (5)-(6). As shown in the estimates including all countries (Regression (1)), both trend coefficients A_1 and B_1 are negative and significant, indicating strong world convergence in the mean as well as in the country-specific volatility of equity premiums. As shown in Regression (2), world convergence is significantly driven by convergence in emerging markets countries, as the trend coefficients in both the mean and variance equations are *lower* (in absolute value) than the coefficients obtained when all countries are included. By the same token, as shown in Regressions (3)-(5), all regions have contributed to increased financial integration as convergence in the mean of equity premiums, although convergence in country-specific volatility appears significant especially in Latin America.

Turning to regional integration, we find that convergence in the mean of equity premiums occurred in each of the regions (Regressions (6)-(8))). With regard to European financial integration, the estimate of the trend coefficient obtained in Regression (8) is significantly larger, in absolute value, than that estimated when emerging European countries are excluded (Regression (9)). Thus, countries in emerging Europe have experienced a faster convergence than the group of other countries, thereby significantly contributing to convergence in the mean of equity premiums *within* that region.

In summary, world financial integration as convergence in equity premiums has progressed significantly. It has been primarily driven by advances in emerging markets countries—particularly in Europe—and has continued to do so despite the global financial crisis.[4]

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[4] Our results are consistent with those obtained by Garcia-Herrero and Wooldridge (2007), who find evidence of a decreasing correlation between domestic investment and savings for samples that do not include the period of the global financial crisis: such decrease in correlation is a broad implication of increased financial integration.

B. A Measure of Financial Integration

The foregoing analysis motivates the construction of measures of the "relative" degree of financial integration within a given set of countries. A proxy measure of such degree of integration is given by the distance of the equity premium of a country from a measure of central tendency of the cross-country distribution of equity premiums in the entire sample. Specifically, for country *j* in year *t*, this measure, called *ISPEED*, is given by

$$ISPEED_{jt} = (X_{jt} - \hat{X}_t)^2, \tag{10}$$

where X_{jt} is the equity premium and $\hat{X}_t$ is the mean of the distribution of equity premiums across the countries considered. In essence, *ISPEED* records the position of the equity premium of a country relative to the group within the cross-country distribution. The higher is the level of financial integration in a country relative to the reference group, the smaller the (quadratic) distance of its equity premium from the group's central tendency. A desirable feature of this measure is that it accounts for time variation of both the equity premium of a country and the average of the group to which it belongs.

III. Financial Integration and Risk-Adjusted Growth Opportunities

As financial integration progresses, the attendant convergence in the cost of capital across countries should have a positive impact on a country's growth opportunities, since integration would foster a more efficient allocation of capital across firms and sectors in each country.

To test these broad implications of theory, we first construct country measures of risk-adjusted growth opportunities, and show that they predict measures of GDP growth. The existence of this predictive power supports our analysis of the dynamic impact financial integration of on risk-adjusted growth opportunities as measures proxying expected growth prospects. This also allows us to employ data at a monthly frequency, which is a frequency seldom used in this kind of tests. *Inter alia*, using a monthly frequency allows us to measure the volatility of PE ratios and with more precision.

A. Risk-Adjusted Growth Opportunities Predict Growth

A forward-looking measure of growth opportunities is given by the evolution of the PE ratio. BHLS have shown that aggregate PE ratios, constructed as earnings-weighted averages of PE ratios of all firms in a market, have predictive power for future real GDP growth.

Differing from BHLS, we construct a measure of growth opportunities using (standardized) PE ratios relative to their *volatility*. The volatility adjustment is important since PE ratios exhibit significant fluctuations that can arise from both market uncertainties regarding future growth of the economy, as well as from the temporary appearance of "bubble" components in some equity markets prices. Thus, *risk-adjusted* (standardized) PE ratios may be better predictors of growth than unadjusted ratios, as we show below. In addition, a measure of risk-adjusted growth opportunities may be viewed as more closely associated with welfare, as welfare is likely to be lower in an economy with very high, but very risky, growth prospects, compared with an economy in which growth relative to growth volatility is lower.

Our measure of risk-adjusted growth opportunities is a Sharpe ratio-type measure. For country *j* in month *t*, it is given by

$$RAGO_{jt} = \frac{PE_{jt} / PE_{wt}}{\sigma(PE_{jt} / PE_{wt})}, \qquad (7)$$

where PE_{jt} denotes the country *j*'s total market PE ratio, PE_{wt} is the world PE ratio and,, $\sigma(PE_{jt} / PE_{wt})$ is the standard deviation of the ratio PE_{jt} / PE_{wt} computed in each month using a rolling window of data of the preceding twelve months.[5] The standardization of the PE ratio with the world PE ratio accounts for cross-country differences in the industry composition of each country's PE ratio. This is akin to evaluating country growth opportunities relative to a proxy measure of global growth opportunities as defined in BHLS.

[5] Such Sharpe ratio-type measures can be obtained by versions of a factor model for countries' PE ratios, with the world PE ratio as a factor.

We test the predictive power of our measure of risk-adjusted growth opportunities for GDP growth using data at an annual frequency, and estimating the following dynamic panel regressions using the Blundell and Bond (1998) system GMM estimator with country and time fixed effects:

$$GDPG_{jt} = \alpha_{1j} + \alpha_{2t} + \beta RAGO_{jt-1} + \gamma GDPG_{jt-1} + \varepsilon_{jt}, \qquad (8)$$

where $GDPG_{jt}$ is real GDP growth in country *j* in year *t*, α_{1j} and α_{2j} are country-specific fixed effects, and $RAGO_{jt-1}$ is our measure of risk-adjusted opportunities for country *j*. Equation (8) can be viewed as the counterpart of the regressions reported by BHLS (Table IV). Differing from BHLS, however, we use not only a larger sample, but also a dynamic panel model gives a more robust of predictive power than the simple static regressions used in BHLS.

As shown in Table 2, an increase in risk adjusted growth opportunities strongly and significantly predicts future growth, and this predictive relationship is equally strong and significant for *both* developed and emerging markets economies.[6] This result justifies the use of our measures of risk-adjusted growth opportunities in our higher frequency samples to examine the predictive power of financial integration for future real activity.

B. Financial Integration Predicts Risk-Adjusted Growth Opportunities

Does a country's level of financial integration have a positive impact on future risk-adjusted growth opportunities? The finding of a positive impact would suggest that financial integration indeed has positive *real* effects. Conversely, the finding that improvements in risk-adjusted opportunities have a positive impact on financial integration would suggest that improvements in growth prospects may spur subsequent financial integration.

The dynamics of *RAGO* and *ISPEED* follows autoregressive processes conditioned on their own past values in a VAR-type fashion. Specifically, the coefficient associated with

[6] Estimating .OLS-type regressions on a smaller sample, BHLS found that the higher PE ratios predict higher real GDP growth, but such relationship is significant *only* for emerging markets. We estimated our dynamic panel specification using PE ratios as proxies of growth opportunities, and found similar results.

past values of *ISPEED* in the *RAGO* equation yields an estimate of the impact of integration on a country's future risk-adjusted growth opportunities. Conversely, the coefficient associated with past values of *RAGO* in the equation of *ISPEED* as dependent variable yields an estimate of the impact of *RAGO* on future financial integration. Thus, the impact of financial integration (risk-adjusted growth opportunities) on future risk-adjusted growth opportunities (future financial integration) is assessed by positing the following panel models for *RAGO* and *ISPEED*:

$$RAGO_{jt} = \alpha_{1j} + \beta_1 ISPEED_{jt-1} + \gamma_1 RAGO_{jt-1} + \delta Y_{1t-1} + \varepsilon_{1jt} \quad (9),$$

$$ISPEED_{jt} = \alpha_{2j} + \beta_2 RAGO_{jt-1} + \gamma_2 ISPEED_{jt-1} + \delta Y_{2t-1} + \varepsilon_{2jt} \quad (10).$$

In both equations, α_{1j} and α_{2j} are country-specific effects and Y_{it-1}, i=1,2, is a vector of time-specific controls to be defined momentarily. Our main focus is on estimates of the coefficients β_1 and β_2, and on testing whether their values are negative and significantly different from zero. These tests essentially aim at establishing whether a country that experiences increased integration, in the form of a *reduction* in the distance of its equity premium from the group average, also witnesses a *subsequent increase* in its risk-adjusted growth opportunities. The finding of a *negative* relationship between the country-specific measure of degree of integration and future risk-adjusted growth opportunities would thus suggest that such opportunities indeed do improve with integration.

One important issue is the possible presence of unit roots in the (panel) data-generating process for *RAGO* and *ISPEED*, since these measures generally exhibit high persistence. This could make it difficult to carry out valid inference on the coefficients of interest if the unit root hypothesis is not rejected. We address this problem by adopting a specification of Equations (9) and (10) along the lines suggested by Pesaran (2007). Doing that makes it feasible to test *both* whether the unit root hypothesis can be rejected and whether the coefficients β_1 and β_2 are negative and significant.

When we subtract the lagged value of the dependent variable from Equations (9) and (10), set the vector of time-specific controls equal to the cross-sectional average of the lagged

level and first difference of the dependent variable as suggested in Pesaran (2007), and denote with Δ first differences, we can estimate the following two equations:

$$\Delta RAGO_{jt} = \alpha_{1j} + \beta_1 ISPEED_{jt-1} + (\gamma_1 - 1) RAGO_{jt-1} + \delta_{11} ARAGO_{t-1} + \delta_{12} A\Delta RAGO_{t-1} + \varepsilon_{1jt} \quad (11),$$

$$\Delta ISPEED_{jt} = \alpha_{2j} + \beta_2 RAGO_{jt-1} + (\gamma_2 - 1) ISPEED_{jt-1} + \delta_{12} AISPEED_{jt-1} +$$

$$+ \delta_{22} A\Delta ISPEED_{jt-1} + \varepsilon_{2jt} \quad (12).$$

In Equation (11), $ARAGO_{t-1} = N^{-1} \sum_{j=1}^{N} RAGO_{jt-1}$ is the cross-sectional average of lagged values of *RAGO,* and $A\Delta RAGO_{t-1} = N^{-1} \sum_{j=1}^{N} \Delta RAGO_{jt-1}$ is its first difference. Similarly, in Equation (12), $AISPEED_{t-1} = N^{-1} \sum_{j=1}^{N} ISPEED_{jt-1}$ is the cross-sectional average of lagged values of *ISPEED,* and $A\Delta ISPEED_{t-1} = N^{-1} \sum_{j=1}^{N} \Delta ISPEED_{jt-1}$ is its first difference. The (panel) unit root hypothesis is rejected if $\gamma_i - 1 < 0$, *i*=1,2.

Table 3 shows the results of these specifications for the entire sample, for Europe, Asia, and Latin America. First note that in all estimates, the unit root hypothesis is rejected with high confidence, since the robust t-statistics associated with $\gamma_i - 1 < 0$, i=1,2 are well below the cross-sectionally augmented Dickey-Fuller critical values reported in Pesaran (2007) at 1 percent confidence levels.

In the entire sample (Regressions (1) and (5)), both coefficients β_1 and β_2 are negative and significant at conventional significance levels. This finding suggests the existence of a virtuous dynamics, whereby a more efficient allocation of capital spurred by financial integration improves future risk-adjusted growth opportunities and, in turn, improved risk-adjusted growth opportunities advance financial integration.

When we look at the same relationships in the context of *regional* integration, as opposed to world integration, we obtain results consistent with the convergence results in equity premiums described previously. The European sample exhibits the same pattern of the world sample: The coefficient β_1 is negative in Regression (2), and both coefficients β_1 and

β_2 are negative and significant in Regression (6)), indicating that the virtuous dynamics between financial integration and risk-adjusted growth opportunities also holds at the regional level. By contrast, such dynamics appears weaker for the Asian and Latin American samples (Regressions (3)-(4) and (7)-(8)), suggesting a higher degree of heterogeneity of the financial integration process in the countries included in these subsamples.

In sum, a country-specific measure of financial integration *predicts* a measure of a country's risk-adjusted growth opportunities. Thus, advances in financial integration have overall improved the efficiency of capital allocation worldwide, particularly that of countries that are integrating most rapidly. Regional financial integration appears to have played a particularly significant growth-enhancing role in Europe. Conversely, better risk-adjusted growth opportunities may, but need not to, foster future advances in integration.

These results indicate that major advanced and emerging market economies have witnessed a virtuous dynamics in the past two decades: advances in financial integration have contributed to improve the efficiency of capital allocation, while countries whose risk-adjusted growth opportunities have improved have also witnessed an improvement in financial integration.

IV. FINANCIAL INTEGRATION, GLOBALIZATION, GROWTH, AND GROWTH VOLATILITY

Kose, Prasad, Rogoff and Wei (2009) observe that in most studies, the relationship between "financial globalization" (which they equate to financial openness) and growth is positive but rather weak. In a similar vein, Obstfeld (2009, p.63) asserts that "there is strikingly little convincing documentation of direct positive impacts of financial opening on the economic welfare levels or growth rates of developing countries". Yet, recent work by Quinn and Toyoda (2008) indicates that some of the inconclusive results of the literature may be due to problems of measurement of financial openness. Moreover, some recent studies (e.g. Bonfiglioli, 2008, and Bekaert, Harvey, Lundblad and Siegel, 2009) find a positive impact of financial openness on productivity growth, which is a key driver of growth.

As already remarked at the outset, financial integration and openness are different concepts. While openness may be necessary for financial integration to occur, it may not be sufficient to guarantee that a country's financial system is integrated with world markets *in*

ways that foster an efficient capital allocation. For example, Stultz (2005) pointed out how poor corporate governance can be an impediment to financial integration. More generally, in recent models by Gourinchas and Jeanne (2006), Heathcote and Perri (2004, 2009) and Mendoza, Quadrini, and Rios-Rull (2009), different degrees of financial integration across countries do not necessarily yield unequivocal predictions on the size and direction of capital flows, hence, on financial openness.

Here we present a novel assessment of the distinct predictive power of financial integration and globalization on *both* growth and growth volatility. Financial integration is proxied by the *ISPEED* measure we have constructed and introduced previously. Our measure of globalization, called *FGLOB,* is the growth rate of financial openness, defined as the ratio of the sum of external assets and liabilities constructed by Lane and Milesi-Ferretti (2007) to GDP. As dictated by Lane and Milesi-Ferretti dataset, we use data at annual frequency. Correspondingly, our monthly *ISPEED* measure is averaged for each year.

We estimate the following dynamic panel models using Blundell and Bond (1998) GMM estimators with country and time fixed effects:

$$GDPG_{jt} = \alpha_{1j} + \alpha_{2t} + \beta ISPEED_{jt-1} + \gamma FGLOB_{jt-1} + \delta GDPG_{jt-1} + \varepsilon_{jt}, \quad (13)$$

$$GDPGV_{jt} = \alpha_{1j} + \alpha_{2t} + \beta ISPEED_{jt-1} + \gamma FGLOB_{jt-1} + \delta GDPGV_{jt-1} + \varepsilon_{jt} \quad (14)$$

The first regression relates GDP growth to lagged values of *ISPEED* and *FGLOB*. In the second regressions, the dependent variable is a proxy measure of volatility of GDP growth, termed *GDPGV,* which is simply computed for each country as the square of the difference between GDP growth and its historical mean.

Note that country fixed effects control for unobserved country characteristics that do not change through time, or change very slowly. Among these characteristics, variables capturing the quality of institutions have been used extensively as explanatory variables in many empirical specifications of growth-type regressions (see, for example, Bekaert, Harvey and Lundblad, 2005 and Bekaert, Harvey, Lundblad and Siegel, 2007). As we will illustrate below, some of these characteristics affect positively both the levels of integration and globalization. However, here, by controlling for these characteristics with country fixed

effects, we detect the *net* impact of financial integration and globalization on growth and growth volatility.

Table 4 reports the results. As shown in Regression (1), financial integration (a lower *ISPEED*) does not have predictive power for growth, but globalization (a higher *FGLOB*) does indeed predict higher growth strongly and significantly. Interestingly, the results are reversed when we look at growth volatility. Regression (3) shows that advances in integration (a lower *ISPEED*) predict *lower* growth volatility, and this predictive power is highly significant, while globalization does not have any predictive power for growth volatility. When we allow for different coefficients for advanced and emerging market economies (Regression (2) and (4)), these predictive relationships turn out to be stronger for emerging markets.

By distinguishing integration and globalization as the "price" and quantity" dimensions of overall countries' integration, it is possible to detect differential effects of these dimensions on growth's first and second moments. If we take a Sharpe-type ratio of GDP growth, these results suggest that both financial integration and globalization predict better volatility-adjusted growth or growth prospects more generally.[7]

V. FINANCIAL INTEGRATION, GLOBALIZATION AND SYSTEMIC REAL RISK

Kose, Prasad, Rogoff and Wei (2009) observe that "there is little formal empirical evidence to support the oft-cited claim that financial globalization in and of itself is responsible for the spate of financial crises that the world has seen over the last three decades" (op. cit., 2009, p.28). Several studies focusing on the impact of financial openness on financial crises find little support for a positive relationship between openness and financial instability. More recently, Bekaert, Harvey and Lumblad (2009) examine the impact of measures of financial openness on a binary indicator of "banking crisis", and find no

[7] Although not strictly comparable due to differences in measurement and country coverage, our results differ from those of Buch, Dopke and Pierdzioch (2005), who do not find a significant impact of financial openness on growth volatility. However, our findings are consistent with those by Beckaert, Harvey and Lundblad (2006), who find that consumption growth volatility is lower as a result of de-jure measures of financial liberalization, Some recent literature has focused on growth volatility at a sectoral or firm level, using a variety of measures of financial openness: a recent review of this literature is in Kalemni-Ozcan, Sorensen and Volosovych (2010).

significant relationship between financial openness and the probability of a "banking crisis".[8] Boyd, De Nicolò and Loukoianova (2010) find some evidence of a positive relationship between financial openness and indicators of systemic bank shocks for country level data, but no relationship between financial openness and the probability of systemic bank failures in Logit regressions based on firm-level data.

Differing from the focus of most studies on systemic *financial* risk, here we assess whether there exists a significant predictive relationship between financial integration, globalization and indicators of systemic *real* risk, as defined in De Nicolò and Lucchetta (2010). To our knowledge, this paper is the first to assess such a relationship.

Specifically, we focus on indicators that capture tail realizations of declines in real activity**.** These measures have the main advantage of eschewing the challenging task of defining and implementing theory-based indicators of bank or financial fragility. If indeed financial crises carry severe adverse real effects, then these effects will be reflected in sharp declines in real activity and will be captured by our indicators.

Our measures of systemic real risk are binary variables that take the value of one if GDP growth in a given year is in the lowest 5^{th} percentile (called SR5) and 10^{th} percentile (called SR10) of the entire cross country distribution of GDP growth, and zero otherwise. As a lower bound to systemic real risk realizations, we also construct a proxy measure of recessions, termed SR0, given by a binary variable that takes the value of one if GDP growth in a given year is negative, and zero otherwise. To maximize the size of the empirical distribution of GDP growth, these percentiles are computed using *all* GDP growth data in our yearly dataset, which includes data for 46 countries in the past 16 years. Then, we estimate a simple Logit model on pooled data with SR5, SR10 and SR0 as dependent variables and lagged measures of financial integration, globalization and GDP growth as dependent (forecasting) variables.

Table 5 reports the results. As shown in Regressions (1) and (3), the probability of a systemic risk realization is *lower* the higher *are both* is the lagged levels of financial

[8] Yet, evidence based on binary "banking crisis" indicators as indicators or bank fragility is unreliable: Boyd, De Nicolò and Loukoianova (2010) have shown that this type of indicators, which are used in a very large number of empirical studies actually measure government responses to banking distress, rather than systemic bank distress.

integration *(ISPEED* is smaller*)* and globalization. Interestingly, and differing from the previous results with growth and growth volatility as the dependent variables, the negative relationship between systemic risk and globalization holds for both advanced and emerging market economies. On the other hand, and consistent with previous results, the negative relationship between the probability of a systemic risk realization and integration appears strongest for emerging markets economies (Regressions (2) and (4)). Lastly, the probability of a "recession" does not depend on financial integration but varies negatively with globalization, and in this case this negative relationship is strongest for advanced economies (Regressions (5) and (6)).

In conclusion, the significant negative relationship between financial integration, globalization and the probability of a systemic risk realization we have uncovered is inconsistent with the conjecture that there exist a trade-off between financial integration, globalization, growth prospects and macroeconomic stability.

VI. The Indirect Effects of Financial Integration on Growth Prospects

The previous two sections illustrated the *direct* effects of financial integration and globalization on risk-adjusted growth and on systemic real risk. This section examines some specific *indirect* channels through which financial integration is likely to improve countries' growth prospects. Specifically, we examine the two-way predictive relationships between integration and globalization, financial developments, and equity markets liquidity.

A. Financial Integration and Globalization

Empirically assessing the dynamic relationship between financial integration and globalization may clarify the extent to which integration may be either necessary or sufficient for globalization, as well as the converse. To this end, we estimated two dynamic panel models with country and time fixed effects relating lagged values of the annual growth rate of a measure of financial openness and our measure of financial integration *ISPEED*.

As shown in Table 6 (Regressions (1) and (3), an advance in financial integration (a *reduction* in *ISPEED*) predicts an increase in globalization with high significance, but the reverse is also true, suggesting the existence of a virtuous dynamics in which integration and

globalization are mutually reinforcing. When we allow the coefficients of *ISPEED* and *FGLOB* to differ between advanced and emerging market economies (Regressions (2) and (4)), we find that the two way relationship between integration and globalization is mainly driven by the emerging market countries: the coefficients associated with *ISPEED* and *FGLOB* for these countries are in fact larger and highly significant, whereas those associated with the variables for advanced economies have the same sign, but are not significant.

B. Financial Integration and Financial Development

A large literature has established the important role of financial development in ensuring growth (see e.g. Levine, 2005). A widely used measure of financial depth at a country level is the ratio of total private credit supplied by the banking system relative to GDP. Using the growth rate of this measure as a proxy measure of financial development, we assessed whether financial integration predicts financial development using a two-equation dynamic panel model similar to the one used previously.

As shown in Table 7, an advance in financial integration predicts an advance in financial development (Regressions (1)), but progress in financial development *does not* predict significantly an advance in integration (Regression (3). suggesting the existence of a causal relationship (in the sense of Granger) from financial integration to financial development. Moreover, the predictive power of integration on financial development is primarily significant in emerging markets countries, with the absence of a predictive power of financial development on integration in both groups of countries (Regression (4)).

These results are important for two reasons. First, they suggest that financial markets integration can be instrumental in spurring progress in the entire financial system, and particularly in the banking sector, since our measure of financial development is essentially bank-based. Second, they support our initial claim—and the focus on equity market integration of a portion of the literature—that equity market integration is a key indicator of financial integration more generally, since it involves a market in which claims to future real activity are traded and valued. Progress in valuation in this market can signal improvements in asset valuations of the corporate and household sectors more generally, which are all factors likely to foster financial development.

C. Financial Integration and Equity Market Liquidity

A third channel through which financial integration might foster growth is through improvements in market liquidity. Improved liquidity in equity markets is a necessary condition for asset valuations to readily reflect changes in fundamentals, as well as being instrumental in lowering firms' cost of capital. Hence, we would like to know whether advances in financial integration lead equity market liquidity. Therefore, we assessed whether our measure of financial integration predicts equity market liquidity, as measured in a standard fashion by stock market turnover. To this end, we estimated a two-equation dynamic panel model similar to the one estimated previously.

As shown in Table 8, advances in financial integration predict significantly advances in equity markets liquidity (Regression (1)), but the reverse does not hold (Regression (3)), again suggesting the existence of a causal relationship (in the sense of Granger) from financial integration to equity markets liquidity. In addition, and similarly to the integration-development nexus described above, the predictive power of integration on equity markets liquidity is primarily significant in emerging markets countries (Regression (2)), with the absence of a predictive power of development on integration in both groups of countries (Regression (4)). Thus, a further indirect benefit of financial integration lies in its fostering equity markets liquidity

VII. The Role of the Quality of Institutions and Corporate Governance

If financial integration and globalization are important drivers of growth prospects and in and of themselves they do not pose risks of macroeconomic instability, a natural question is: what are their main determinants? Addressing this question aiming at identifying precise mechanisms would require explicit theoretical modeling, which is a task outside the scope of this paper.

Nonetheless, we find it informative to document simple relationships between our integration and globalization measures with two sets of potential determinants that many contributions in the literature have singled out as impacting on the levels of financial

integration and globalization: the quality of the institutional environment and that of corporate governance.

We consider the governance indicators constructed by Kaufmann, Krey and Mastruzzi (2009) as measures of the quality of institutions. These include six survey-based measures of institutional quality: *Control of Corruption,* the extent to which public power is exercised for private gain; *Voice and Accountability*, citizens' ability to participate in selecting their government; *Political Stability,* the stability of elected government bodies, *Government Effectiveness*, the quality of public services and that of policy formulation and implementation; *Regulatory Quality*, the ability of the government to implement regulations that permit and promote private sector development; and *Rule of Law,* the quality of contract enforcement and protection of property rights.

As measures of the quality of corporate governance, we take the three indicators of the corporate governance quality index constructed by De Nicolò, Laeven and Ueda (2008), and updated to the year 2008. These indicators capture the quality of corporate governance in the dimensions of accounting disclosure and transparency, and are standardized so that an increase of an indicator signals better corporate governance. The first indicator, *Accounting Standards,* captures the degree of accounting disclosure of firms in a country. The second indicator, *Earning Smoothing*, is a measure of "earnings opacity" that tracks the extent to which managers may conceal the true performance of firms using accruals to smooth fluctuations of annual profits. The third indicator is a measure of *Stock Price Synchronicity*: more synchronous stock price movements have been typically found in countries in which corporate governance is poor and financial systems are less developed.

The relationship between financial integration, globalization, and the quality of institutions and corporate governance was estimated by means of the following random effect model:

$$Y_{jt} = \alpha + \alpha_{1t} + \beta X_{jt} + \eta_{jt} + \varepsilon_{jt}, \qquad (15)$$

where Y_{jt} is the financial integration measure *ISPEED* or the financial globalization measure *FGLOB,* X_{jt} are the indicators of quality of institutions and corporate governance, α_{1t} are time fixed effects, and η_{jt} are random effects.

Table 9 reports the results of the estimates of the coefficients associated with each institutional and corporate governance variable. Next to each estimate, we also report the quantitative impact of each variable on the dependent variable whenever the relevant coefficient is significant at least at a 10 percent confidence level. This is measured as the change in Y_{jt} implied by a standard deviation increase in X_{jt} as a fraction of the sample mean of Y_{jt}.

Note that each indicator of the quality of institutions has a positive and quantitatively significant impact on both financial integration and globalization. Interestingly, Government Effectiveness and Regulatory Quality have the largest quantitative for financial integration, while Political Stability and the Rule of Law have the largest quantitative impact for the globalization indicator. These results are consistent with the view that political instability and weak law enforcement contribute to keep capital markets segmented (see Bekaert, 1995) and discourage foreign direct investment. With regard to corporate governance, only Earning Smoothing has a significant and sizeable impact on financial integration, whereas both Earning Smoothing and Accounting have a positive impact on globalization, with sizeable quantitative effects.

In sum, both financial integration and globalization are positively affected by the quality of institutions and corporate governance. Yet, specific dimensions of institutional quality and corporate governance affect financial integration and globalization differentially: this evidence further demonstrates that financial integration and globalization are related but different phenomena.

VIII. CONCLUSIONS

This paper has analyzed the implications of worldwide and regional financial integration for the efficiency of capital allocation and its impact on countries' growth prospects. We have shown that financial integration has progressed significantly worldwide, particularly in emerging markets, and that advances in financial integration predict future increases in a country's risk-adjusted growth opportunities, while better risk-adjusted growth opportunities do not necessarily predict future advances in integration. Furthermore, financial integration and globalization predict both improvements in countries' growth prospects as

well as lower probabilities of systemic real risk realizations. Advances in financial integration and globalization are mutually reinforcing, and financial integration fosters domestic financial development and improvements in equity markets liquidity. Lastly, higher levels of financial integration and globalization are associated with better institutions and corporate governance.

Overall, these results suggest that financial integration and globalization are likely to yield the beneficial real effects resulting from a more efficient resource allocation predicted by theory, and we find no costs in the dimension of macroeconomic instability. Policies aimed at fostering financial integration of capital markets and financial sectors, as well as removing impediments to financial globalization, may be necessary, albeit not sufficient, to allow countries to reap their benefits.

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Table 1. Convergence of Cross-Country Variances and Idiosyncratic Volatility of Equity Premiums

The estimated model is:

$$\bar{\sigma}_X^2(t) = A_0 + A_1 t + A_2 F_t^2 + A_3 \bar{\sigma}_X^2(t-1) + H_t \eta_t$$

$$H_t^2 = B_0 + B_1 t + B_2 \eta_{t-1}^2 + B_3 H_{t-1}^2$$

$\bar{\sigma}_X^2(t)$ is the cross-sectional variance of equity premiums, and H_t^2 is the variance of $\bar{\sigma}_X^2(t)$ net of the variance of the common risk factor F_t, estimated as the first principal component of countries' equity premiums. p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of monthly data is 1985:1-2009:04.

A. World Integration

	(1) All Countries	(2) Excluding Emerging Markets	(3) Excluding Asia	(4) Excluding Latin America	(5) Excluding Europe
Mean Equation					
A0	99.743***	0.903**	224.825***	5.327***	-37.260***
	[0.00]	[0.02]	[0.00]	[0.00]	[0.00]
A1	**-0.370*** **	**-0.002*** **	**-0.247*** **	**-0.205*** **	**-0.092*** **
	[0.00]	**[0.05]**	**[0.00]**	**[0.00]**	**[0.00]**
A2	0.020***	0.001***	0.031***	0.027***	0.017
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
A3	-0.062**	0.805***	-0.103	0.098	0.368***
	[0.04]	[0.00]	[0.27]	[0.00]	[0.00]
Variance Equation					
B0	121.548***	0.006	155.165	21.924***	2.214
	[0.00]	[0.91]	[0.11]	[0.00]	[0.87]
B1	**-0.380*** **	**0.001**	**-0.423**	**1.512*** **	**-0.005**
	[0.00]	**[0.93]**	**[0.13]**	**[0.00]**	**[0.90]**
B2	6.809***	0.557***	4.167***	0.197***	1.059***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
B3	0.006	0.576***	0.014	-0.033***	0.486***
	[0.34]	[0.00]	[0.29]	[0.00]	[0.00]

B. Regional Integration

	(6) Asia	(7) Latin America	(8) Europe	(9) Europe Excluding Emerging Europe
Mean Equation				
A0	8.764***	-9.929***	16.757***	0.575**
	[0.00]	[0.00]	[0.00]	[0.03]
A1	**-0.042*** **	**-0.226*** **	**-0.120*** **	**-0.002** **
	[0.00]	**[0.00]**	**[0.00]**	**[0.04]**
A2	0.049***	0.007***	0.042***	0.001***
	[0.00]	[0.00]	[0.00]	[0.00]
A3	0.107**	0.504***	0.255***	0.855***
	[0.02]	[0.00]	[0.00]	[0.00]
Variance Equation				
B0	11.168***	60.733***	-6.528	-0.003
	[0.00]	[0.00]	[0.26]	[0.83]
B1	**-0.022**	**-0.183*** **	**0.111**	**-0.001**
	[0.25]	**[0.00]**	**[0.16]**	**[0.83]**
B2	1.133***	6.681	1.867***	0.441***
	[0.00]	[0.75]	[0.00]	[0.00]
B3	0.271***	0.098***	0.091	0.707***
	[0.00]	[0.00]	[0.17]	[0.00]

Table 2. Risk-Adjusted Growth Opportunities Predict Growth

The estimated model is: $GDPG_{jt} = \alpha_{1j} + \alpha_{2t} + \beta RAGO_{jt-1} + \gamma GDPG_{jt-1} + \varepsilon_{jt}$,

GDPG is real GDP growth, *RAGO* is the measure of risk-adjusted growth opportunities. α_{1j} are country fixed effects, and α_{2t} are time fixed-effects Estimates are obtained by the GMM System estimator of Blundell and Bond (1998). M1 and M2 are the p-values of the Arellano-Bond statistics for first and second order correlation of residuals; Sargan is the p-value obtained by estimates of the two-step version of the models. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of annual data is 1985-2009.

	(1)	(2)
	GDPG(t)	GDPG(t)
GDPG(t-1)	0.343***	0.341***
	[0.00]	[0.00]
RAGO(t-1)	**1.613*** **	
	[0.00]	
RAGO(t-1)*ADV		**1.175*** **
		[0.00]
RAGO(t-1)*(1-ADV)		**1.759*** **
		[0.00]
Constant	0.252	0.278
	[0.56]	[0.53]
M1(p-value)	0.00	0.00
M2(p-value)	0.95	0.98
Sargan(p-value)	1.00	1.00
Observations/Countries	870/50	870/50

Table 3. Financial Integration and Risk-Adjusted Growth Opportunities

The estimated models are:

$$\Delta RAGO_{jt} = \alpha_{1j} + \beta_1 ISPEED_{jt-1} + (\gamma_1 - 1) RAGO_{jt-1} + \delta_{11} ARAGO_{t-1} + \delta_{12} A\Delta RAGO_{t-1} + \varepsilon_{1jt}$$

$$\Delta ISPEED_{jt} = \alpha_{2j} + \beta_2 RAGO_{jt-1} + (\gamma_2 - 1) ISPEED_{jt-1} + \delta_{12} AISPEED_{jt-1} + \delta_{22} A\Delta ISPEED_{jt-1} + \varepsilon_{2jt}$$

RAGO is the measure of risk-adjusted growth opportunities, and *ISPEED* is the measure of financial integration. The other variables are explained in the text. Estimates are obtained with country fixed effects regressions. Standard errors are clustered by country. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of monthly data is 1085:01-2009:04.

	(1) All countries	**(2) Europe**	**(3) Asia**	**(4) Latin America**
	DRAGO(t)	**DRAGO(t)**	**DRAGO(t)**	**DRAGO(t)**
ISPEED(t-1)	**-0.001****	**-0.001****	**-0.001****	**-0.003*****
	[0.01]	**[0.02]**	**[0.04]**	**[0.00]**
RAGO(t-1)	-0.158***	-0.144***	-0.081***	-0.306**
	[0.00]	[0.00]	[0.00]	[0.03]
ARAGO(t-1)	0.078*	0.0687	-0.001	0.223*
	[0.08]	[0.17]	[0.96]	[0.08]
ADRAGO(t-1)	0.528***	0.561***	0.478***	0.509***
	[0.00]	[0.00]	[0.00]	[0.00]
R-squared (within)	0.256	0.266	0.257	0.265
R-squared (between)	0.006	0.001	0.022	0.049
	(5) All countries	**(6) Europe**	**(7) Asia**	**(8) Latin America**
	DISPEED(t)	**DISPEED(t)**	**DISPEED(t)**	**DISPEED(t)**
RAGO(t-1)	**-0.129***	**-0.225***	**-0.037**	**-0.171***
	[0.08]	**[0.07]**	**[0.25]**	**[0.09]**
ISPEED(t-1)	-0.280***	-0.310***	-0.218***	-0.167***
	[0.00]	[0.00]	[0.00]	[0.00]
AISPEED(t-1)	0.193**	0.193**	0.089**	0.051
	[0.02]	[0.04]	[0.02]	[0.21
ADISPEED(t-1)	-0.264***	-0.236**	-0.470***	-0.035
	[0.00]	[0.01]	[0.00]	[0.39]
R-squared (within)	0.133	0.077	0.160	0.071
R-squared (between)	0.061	0.074	0.230	0.116
Observations/countries	10102/48	5348/26	3164/14	1566/8

Table 4. Financial Integration, Globalization, Growth and Growth Volatility

The estimated models are:

$$GDPG_{jt} = \alpha_{1j} + \alpha_{2t} + \beta ISPEED_{jt-1} + \gamma FG_{jt-1} + \delta GDPG_{jt-1} + \varepsilon_{jt},$$

$$GDPGV_{jt} = \alpha_{1j} + \alpha_{2t} + \beta ISPEED_{jt-1} + \gamma FGLOB_{jt-1} + \delta GDPGV_{jt-1} + \varepsilon_{jt}$$

GDPG is GDP growth, GDPGV is the proxy measure of GDP growth volatility, *ISPEED* is the financial integration measure, and *FGLOB is* the financial globalization measure. α_{1j} are country fixed effects, and α_{2t} are time fixed-effects. Estimates are obtained by the GMM System estimator of Blundell and Bond (1998). M1 and M2 are the p-values of the Arellano-Bond statistics for first and second order correlation of residuals; Sargan is the p-value obtained by estimates of the two-step version of the models. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of annual data is 1992-2008.

	(1)	(2)	(3)	(4)
	GDPG(t)	**GDPG(t)**	**GDPGV(t)**	**GDPGV(t)**
GDPG(t-1)	0.461***	0.395***		
	[0.00]	[0.00]		
GDPGV(t-1)			0.0556	0.0684
			[0.22]	[0.23]
ISPEED(t-1)*ADV		***0.00684***		***-0.0296***
		[0.32]		***[0.35]***
ISPEED(t-1)*(1-ADV)		***-0.000171***		***0.00216******
		[0.28]		***[0.00]***
FGLOB(t-1)*ADV		***0.0576******		***0.0964***
		[0.00]		***[0.43]***
FGLOB(t-1)*(1-ADV)		***0.0455****		***-0.0958***
		[0.06]		***[0.31]***
ISPEED(t-1)	**-0.000102**		**0.00239*****	
	[0.347]		**[0.00]**	
FGLOB(t-1)	**0.0539*****		**-0.0338**	
	[0.00]		**[0.57]**	
Constant	0.278	2.285***	6.897***	5.583***
	[0.818]	[0.00]	[0.00]	[0.00]
M1(p-value)	0.00	0.00	0.01	0.01
M2(p-value)	0.17	0.16	0.67	0.81
Sargan(p-value)	1.00	1.00	1.00	1.00
Observations/Countries	687/46	687/46	687/46	687/46

Table 5. Financial Integration, Globalization and Systemic Real Risk

The estimated models are of the form:

$$P(SR_{jt} = 1) = Logit(\alpha + \beta ISPEED_{jt-1} + \gamma FG_{jt-1} + \delta GDPG_{jt-1})$$

SR are the indicators of systemic real risk: SR5 and SR10 equal to 1 if real GDP growth is lower than the 5th and 10th percentile of the cross-country distribution of GDP growth, and 0 otherwise; SR0 equals to 1 if real GDP growth is negative, and 0 otherwise. *ISPEED* is the financial integration measure, and *FG* is the financial globalization measure *FGLOB*, given by the annual growth rate of financial openness *(*absolute value of *FGLOB*), and *GDPG* is GDP growth. Estimates are obtained by Logit pooled regressions with standard errors clustered by country. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of annual data is 1992-2008.

	(1)	(2)	(3)	(4)	(5)	(6)
	SR5	**SR5**	**SR10**	**SR10**	**SR0**	**SR0**
ISPEED(t-1)*ADV		***-0.0112***		***-0.0120***		***-0.00329***
		[0.36]		***[0.42]***		***[0.69]***
ISPEED(t-1)*(1-ADV)		***0.000280****		***0.000156***		***0.000155***
		[0.04]		***[0.20]***		***[0.21]***
FGLOB(t-1)*ADV		***-0.250*****		***-0.0652****		***-0.0448****
		[0.00]		***[0.02]***		***[0.03]***
FGLOB(t-1)*(1-ADV)		***-0.0331****		***-0.0453*****		***-0.0497*****
		[0.08]		***[0.00]***		***[0.00]***
GDPG(t-1)	-0.186		-0.218***		-0.263***	
	[0.14]		[0.00]		[0.00]	
GDPG(t-1)*ADV		0.239***		-0.0941		-0.239**
		[0.00]		[0.46]		[0.03]
GDPG(t-1)*(1-ADV)		-0.481***		-0.199		-0.0496
		[0.00]		[0.18]		[0.71]
ADV		-7.444***		-2.258***		-1.589***
		[0.00]		[0.00]		[0.00]
EME		-2.593***		-1.487***		-1.420***
		[0.00]		[0.00]		[0.00]
ISPEED(t-1)	**0.000550*****		**0.000308****		**0.000191**	
	[0.00]		**[0.04]**		**[0.11]**	
FGLOB(t-1)	**-0.0350***		**-0.0448*****		**-0.0461*****	
	[0.05]		**[0.00]**		**[0.00]**	
Constant	-3.750***		-2.044***		-1.572***	
	[0.00]		[0.00]		[0.00]	
Pseudo R2	0.23	0.36	0.11	0.13	0.11	0.11
Observations/Countries	732/46	732/46	732/46	732/46	732/46	732/46

Table 6. Financial Integration and Globalization

The estimated models are:

$$FGLOB_{jt} = \alpha_{1j} + \alpha_{1t} + \beta_1 ISPEED_{jt-1} + \gamma_1 FGLOB_{jt-1} + \varepsilon_{1jt}$$
$$ISPEED_{jt} = \alpha_{2j} + \alpha_{1t} + \beta_2 FGLOB_{jt-1} + \gamma_2 ISPEED_{jt-1} + \varepsilon_{2jt}$$

ISPEED is the financial integration measure, and *FGLOB* is the financial globalization measure, given by the annual growth rate of financial openness. α_{2t} denotes time fixed-effects. Estimates are obtained by the GMM System estimator of Blundell and Bond (1998). M1 and M2 are the p-values of the Arellano-Bond statistics for first and second order correlation of residuals; Sargan is the p-value obtained by estimates of the two-step version of the models. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of annual data is 1992-2008.

	(1)	(2)	(3)	(4)
	FGLOB(t)	FGLOB(t)	ISPEED(t)	ISPEED(t)
FGLOB(t-1)	-0.0239	-0.0248	-10.11**	
	[0.62]	[0.61]	[0.02]	
ISPEED(t-1)*ADV		0.0119		
		[0.58]		
ISPEED(t-1)*(1-ADV)		-0.000976**		
		[0.01]		
ISPEED(t-1)	-0.00101**		0.502***	0.502***
	[0.01]		[0.00]	[0.00]
FGLOB(t-1)*ADV				-2.460
				[0.13]
FGLOB(t-1)*(1-ADV)				-12.68**
				[0.01]
Constant	4.523***	4.362***	188.2*	77.40**
	[0.00]	[0.00]	[0.05]	[0.04]
M1(p-value)	0.00	0.00	0.02	0.02
M2(p-value)	0.78	0.79	0.24	0.24
Sargan(p-value)	1.00	1.00	1.00	1.00
Observations/Countries	733/46	733/46	688/46	688/46

Table 7. Financial Integration and Financial Development

The estimated models are:
$$FINDEEP_{jt} = \alpha_{1j} + \alpha_{2t} + \beta_1 ISPEED_{jt-1} + \gamma_1 FINDEEP_{jt-1} + \varepsilon_{1jt}$$
$$ISPEED_{jt} = \alpha_{1j} + \alpha_{2t} + \beta_2 FINDEEP_{jt-1} + \gamma_2 ISPEED_{jt-1} + \varepsilon_{2jt}$$
,

FINDEEP is the annual growth rate of the ratio of private credit to GDP. *ISPEED* is the financial integration measure. . Estimates are obtained by the GMM System estimator of Blundell and Bond (1998). M1 and M2 are the p-values of the Arellano-Bond statistics for first and second order correlation of residuals; Sargan is the p-value obtained by estimates of the two-step version of the models. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of annual data is 1992-2008.

	(1)	(2)	(3)	(4)
	FINDEEP(t)	FINDEEP(t)	ISPEED(t)	ISPEED(t)
FINDEEP(t-1)	0.490***	0.489***	1.010	
	[0.00]	[0.00]	[0.68]	
ISPEED(t-1)*ADV		0.0181		
		[0.49]		
ISPEED(t-1)*(1-ADV)		-0.00285***		
		[0.00]		
ISPEED(t-1)	-0.00290***		0.330***	0.331***
	[0.00]		[0.00]	[0.00]
FINDEEP(t-1)*ADV				-1.311
				[0.22]
FINDEEP(t)*(1-ADV)				2.556
				[0.55]
Constant	8.307	4.098*	24.87	30.32**
	[0.26]	[0.05]	[0.16]	[0.03]
M1(p-value)	0.02	0.02	0.09	0.1
M2(p-value)	0.00	0.00	0.37	0.36
Sargan(p-value)	1.00	1.00	1.00	1.00
Observations/Countries	622/43	622/43	627/43	627/43

Table 8. Financial Integration and Equity Markets Liquidity

The estimated models are: ,

$$SMTURNOVER_{jt} = \alpha_{1j} + \alpha_{2t} + \beta_1 ISPEED_{jt-1} + \gamma_1 SMTURNOVER_{jt-1} + \varepsilon_{1jt}$$
$$ISPEED_{jt} = \alpha_{1j} + \alpha_{2t} + \beta_2 SMTURNOVER_{jt-1} + \gamma_2 ISPEED_{jt-1} + \varepsilon_{2jt}$$

SMTURNOVER is stock market turnover. *ISPEED* is the financial integration measure. Estimates are obtained by the GMM System estimator of Blundell and Bond (1998). M1 and M2 are the p-values of the Arellano-Bond statistics for first and second order correlation of residuals; Sargan is the p-value obtained by estimates of the two-step version of the models. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01. The range of annual data is 1992-2008.

	(1)	(2)	(3)	(4)
	SMTURNOVER(t)	SMTURNOVER(t)	ISPEED(t)	ISPEED(t)
SMTURNOVER(t-1)	0.724**	0.722***	301.9	
	[0.03]	[0.00]	[0.23]	
ISPEED(t-1)	-0.00006***		0.478***	0.446***
	[0.00]		[0.00]	[0.00]
ISPEED(t-1)*ADV		-0.00131		
		[0.26]		
ISPEED(t-1)*(1-ADV)		-6.23e-05***		
		[0.00]		
SMTURNOVER(t-1)*ADV				36.29
				[0.52]
SMTURNOVER(t-1)*(1-ADV)				680.2
				[0.16]
Constant	1.831**	1.852**	-107.6	-105.0
	[0.03]	[0.03]	[0.34]	[0.27]
M1(p-value)	0.02	0.02	0.06	0.04
M2(p-value)	0.17	0.17	0.25	0.22
Sargan(p-value)	1.00	1.00	1.00	1.00
Observations/Countries	570/45	540/45	585/45	585/45

Table 9. Financial Integration, Globalization, and the Quality of Institutions and Corporate Governance

The estimated model is: $Y_{jt} = \alpha + \alpha_{1t} + \beta X_{jt} + \eta_{jt} + \varepsilon_{jt}$,

Y_{jt} is the financial integration measure ISPEED *or* the financial globalization measure *FGLOB (*annual growth rate of financial openness). X_{jt} are indicators of quality of institutions and corporate governance. Estimates are obtained by random effect regressions with standard errors clustered by country. The *quantitative impact* is the change in Y_{jt} implied by a standard deviation increase in X_{jt} as a fraction of the sample mean of Y_{jt}, reported for coefficients with p-values lower than 0.10. Robust p-values are reported in brackets; * denotes p <0.10, ** p <0.05, *** p<0.01.

	(1)	(2)	(3)	(4)
	ISPEED	***Quantitative Impact***	**FGLOB**	***Quantitative Impact***
Quality of Institutions				
Control of Corruption	-5.081***	-1.23	0.0571**	1.39
	[0.00]		[0.02]	
Voice and Accountability	-3.160***	-0.73	0.0684***	1.6
	[0.00]		[0.00]	
Political Stability	-3.532***	-0.97	0.0610***	**1.63**
	[0.00]		[0.00]	
Government Effectiveness	-8.023**	**-1.57**	0.0571*	1.14
	[0.01]		[0.06]	
Regulatory Quality	-7.005**	**-1.44**	0.0690**	1.42
	[0.01]		[0.03]	
Rule of Law	-4.808***	-1.16	0.0628***	**1.51**
	[0.00]		[0.00]	
Quality of Corporate Governance				
Accounting Standards	-662.1		45.99***	**2.43**
	[0.16]		[0.00]	
Earnings Smoothing (Opacity)	-200.4**	**-0.69**	6.778**	**2.28**
	[0.04]		[0.04]	
Stock Price Synchronicity	1427		20.45	
	[0.122]		[0.244]	